UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>11 April 2006</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-32</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-32</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

DETAILED ACTION

1.   This office action is in response to the preliminary amendment filed 4/11/2006.

Claims 1 – 32 are pending in the application.

Specification

2.   The following guidelines illustrate the preferred layout for the specification of a
utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

        As provided in 37 CFR 1.77(b), the specification of a utility application should
include the following sections in order. Each of the lettered items should appear in
upper case, without underlining or bold type, as a section heading. If no text follows the
section heading, the phrase "Not Applicable" should follow the section heading:

        (a) TITLE OF THE INVENTION.
        (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
        (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR
              DEVELOPMENT.
        (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
        (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A
              COMPACT DISC.
        (f) BACKGROUND OF THE INVENTION.
              (1) Field of the Invention.
              (2) Description of Related Art including information disclosed under 37
              CFR 1.97 and 1.98.
        (g) BRIEF SUMMARY OF THE INVENTION.
        (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
        (i) DETAILED DESCRIPTION OF THE INVENTION.
        (j) CLAIM OR CLAIMS (commencing on a separate sheet).
        (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
        (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A
              "Sequence Listing" is required on paper if the application discloses a
              nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if
              the required "Sequence Listing" is not submitted as an electronic
              document on compact disc).

The specification filed 04/11/2006 does not include a section for "Background of the Invention".

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4.   Claims 1 – 21 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the steps required for operating a secondary operating system on a computer. Claim 1 recites a method that only includes one step ("a secondary operating system driver (SOS driver) of the primary operating system is loaded"). It is unclear how loading the "secondary operating system driver" accomplishes the method of operating a secondary operating system on a computer. Examiner also notes that the limitation "for loading and controlling the secondary operating system" recites the intended use of the SOS driver and this limitation are not given patentable weight.

5.   Claims 22 – 30 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. Claims 22 and 32 only recite functional language and do not recite any element of the claimed device. Claims 22 and 32 recite a device for operating a

secondary operating system and indicates that a secondary operating system driver is

constructed. Claims 22 and 32 fail to identify any elements of the device.

6. Claims 14 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Regarding claims 14 and 28, the phrase "i.e." renders the claim indefinite

because it is unclear whether the limitation(s) following the phrase are part of the

claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1 – 4, 6 – 10, 12, 13, 15, 17 - 19, 21, 22, 24, 31 and 32 are rejected**

under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,996,828 to

Kimura et al. [hereinafter Kimura].

9.   As to claim 1, Kimura teaches a method for operating (implementing) a secondary operating system [second OS; col. 5, lines 5 – 9] on a computer [computer 100; col. 3, line 64 – col. 4, line 3] in addition to a primary operating system [first OS; col. 4, lines 60 – 65], wherein a secondary operating system driver (SOS driver) of the primary operating system is loaded [control for running the multi-OS is incorporated as a device driver for the first OS (hereinafter referred to as multi-OS driver); col. 10, lines 19 – 22 and 54 – 60; col. 11, lines 14 – 20; col. 12, lines 4 – 10] for loading [loading the second OS by execution of the multi-OS management program in the first OS, Fig. 15; col. 12, lines 24 – col. 13, line 13] and controlling the secondary operating system [col. 12, lines 11 – 23 and 45 – 52; col. 14, lines 5 – 20; col. 15, lines 13 – 36].

10.   As to claim 22, Kimura teaches a device [computer 100; col. 3, line 64 – col. 4, line 3] for operating a secondary operating system [second OS; col. 5, lines 5 – 9] on a computer in addition to a primary operating system [first OS; col. 4, lines 60 – 65], wherein a secondary operating system driver (SOS driver) [control for running the multi-OS is incorporated as a device driver for the first OS (hereinafter referred to as multi-OS driver); col. 10, lines 19 – 22 and 54 – 60; col. 11, lines 14 – 20; col. 12, lines 4 – 10] of the primary operating system for loading [loading the second OS by execution of the multi-OS management program in the first OS, Fig. 15; col. 12, lines 24 – col. 13, line 13] and controlling the secondary operating system is constructed [col. 12, lines 11 – 23 and 45 – 52; col. 14, lines 5 – 20; col. 15, lines 13 – 36].

11.   As to claim 31, Kimura teaches a method for operating (implementing) a

secondary operating system [second OS; col. 5, lines 5 – 9] on a computer [computer

100; col. 3, line 64 – col. 4, line 3] in addition to a primary operating system [first OS;

col. 4, lines 60 – 65] in which a change from the primary operating system to the

secondary operating system takes place through an interrupt call [external interrupt of

the hardware device managed by the second OS is produced during execution of the

first OS, Step 1806 is executed; col. 16, lines 52 – col. 17, line 6 and col. 14, lines 20 –

28], wherein a secondary operating system driver (SOS driver) in the primary operating

system is loaded and activated [control for running the multi-OS is incorporated as a

device driver for the first OS (hereinafter referred to as multi-OS driver); col. 10, lines 19

– 22 and 54 – 60; col. 11, lines 14 – 20; col. 12, lines 4 – 10] for loading [loading the

second OS by execution of the multi-OS management program in the first OS, Fig. 15;

col. 12, lines 24 – col. 13, line 13] and controlling the secondary operating system [col.

12, lines 11 – 23 and 45 – 52; col. 14, lines 5 – 20; col. 15, lines 13 – 36], wherein by

means of an interrupt call servicing routine in the system driver said secondary

operating system driver (SOS driver) [interrupt handler; col. 15, lines 58 – col. 16, line

11] determines the information stored in the interrupt table [interrupt identification table

1620; col. 15, lines 58 – 65] of the secondary operating system (SOS) as to the point in

the latter where the running of the interrupt is to take place [judgment is performed by

referring to the OS column 1621 while the interrupt number of the interrupt identification

table 1620 is used as an index; col. 15, line 58 – col. 16, line 57 and col. 11, lines 21 –

32].

12.   As to claim 32, Kimura teaches a device [computer 100; col. 3, line 64 – col. 4,

line 3] for operating a secondary operating system [second OS; col. 5, lines 5 – 9] on a

computer in addition to a primary operating system [first OS; col. 4, lines 60 – 65] in

which a change from the primary operating system to the secondary operating system

takes place through an interrupt call [external interrupt of the hardware device managed

by the second OS is produced during execution of the first OS, Step 1806 is executed;

col. 16, lines 52 – col. 17, line 6 and col. 14, lines 20 – 28], wherein it is constructed by

a secondary operating system driver (SOS driver) of the primary operating system

[control for running the multi-OS is incorporated as a device driver for the first OS

(hereinafter referred to as multi-OS driver); col. 10, lines 19 – 22 and 54 – 60; col. 11,

lines 14 – 20; col. 12, lines 4 – 10] for loading [loading the second OS by execution of

the multi-OS management program in the first OS, Fig. 15; col. 12, lines 24 – col. 13,

line 13] and controlling the secondary operating system [col. 12, lines 11 – 23 and 45 –

52; col. 14, lines 5 – 20; col. 15, lines 13 – 36], wherein for execution of the interrupt

routine an interrupt call servicing routine [interrupt handler; col. 15, lines 58 – col. 16,

line 11] in the system driver is constructed for determining the information stored in the

interrupt table [interrupt identification table 1620; col. 15, lines 58 – 65] of the secondary

operating system as to the point in the latter where interrupt running is to take place

[judgment is performed by referring to the OS column 1621 while the interrupt number

of the interrupt identification table 1620 is used as an index; col. 15, line 58 – col. 16,

line 57 and col. 11, lines 21 – 32].

13.   As to claim 2, Kimura teaches wherein the secondary operating system driver

(SOS driver) subsequently loads the secondary operating system [col. 12, lines 24 –

col. 13, line 23].

14.   As to claim 3, Kimura teaches wherein the secondary operating system driver

loads the secondary operating system [loading the second OS by execution of the multi-

OS management program in the first OS, Fig. 15; col. 12, lines 24 – col. 13, line 13].

15.   As to claim 4, Kimura teaches wherein memory contexts (virtual operating areas)

are created in the central processing unit (CPU) [col. 4, lines 20 – 37].

16.   As to claim 6, Kimura teaches wherein there is an exchange of interrupt tables on

changing the dependence of the operating systems [col. 13, lines 5 – 13].

17.   As to claim 7, Kimura teaches wherein the secondary operating system controls

a change to the primary operating system [col. 13, line 34 – col. 14, line 19].

18.   As to claim 8, Kimura teaches wherein a change from the secondary operating

system to the primary operating system takes place when the secondary operating

system is idle (entry into the idle loop) [first OS can run only when the second is idle;

col. 13, lines 26 – 33]

19.   As to claim 9, Kimura teaches wherein a change from the secondary operating

system to the primary operating system takes place through an instruction in the

program sequence of the secondary operating system [OS switching procedure; col. 14,

lines 1 – 29].

20.   As to claim 10, Kimura teaches wherein a change from the primary operating

system to the secondary operating system takes place through an interrupt call [col. 16,

lines 52 – 56].

21.   As to claim 12, Kimura teaches wherein interrupt calls of the primary operating

system are inhibited during the secondary operating system sequence [col. 15, lines 1 –

12].

22.   As to claim 13, Kimura teaches wherein an interrupt servicing routine in the SOS

operator reads the interrupt call table of the secondary operating system and the

processing of the latter takes place or is continued at the point relative to the interrupt

call [receives the address of the second OS module executed after switching from the

first OS to the second OS; col. 14, lines 24 – 55].

23.   As to claim 15, Kimura teaches wherein by means of an interrupt call servicing

routine in the system driver, the information stored in the interrupt table of the

secondary operating system (SOS) is determined as to the point in the latter where the

running of the interrupt is to take place [col. 15, line 58 – col. 16, line 57 and col. 11,

lines 21 – 32].

24.   As to claim 17, Kimura teaches wherein after occurrence a corresponding

interrupt call and determination of the point in the secondary operating system where

interrupt running is to take place is determined, processing thereof at the point in the

secondary operating system concerning the interrupt call is continued [col. 12, lines 54

– 67].

25.   As to claim 18, Kimura teaches wherein on changing from one operating system

to the other all the system states of one operating system are stored [OS context table;

col. 13, lines 26 – 33].

26.   As to claim 19, Kimura teaches wherein on changing from one operating system

to the other all system states of the other operating system are loaded [col. 13, lines 34

– 45].

27.   As to claim 21, Kimura teaches clock generation for the primary operating system

takes place through a clock system driver [col. 4, lines 11 – 12].

28.   As to claim 24, Kimura teaches wherein said device is constructed for

exchanging interrupt tables on a change of activity of the operating systems [col. 13,

lines 5 – 13].

Claim Rejections - 35 USC § 103

29.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

30.   **Claims 5, 11, 14, 16, 20, 23, and 25 – 30 are rejected under 35 U.S.C. 103(a)**

as being unpatentable over Kimura in view of U.S. Patent Application Publication

No. 20040205755 to Lescouet et al. [hereinafter Lescouet].

31.   As to claim 5, Kimura teaches wherein a change between the operating systems

takes place by means of the SOS driver of the primary operating system [col. 12, lines

24 – col. 13, line 13 and col. 14, lines 1 – 4]. Kimura does not teach a board support

package (BSP).

However, Lescouet teaches switching between operating systems [paragraph

0088], a Board Support Package [paragraphs 0061 and 0064], and using the Board

Support Package to change between operating systems [Board Support Package are

specially adapted to assist the hardware resource dispatcher in virtualizing the shared

devices for secondary operating systems; paragraph 0064].

It would have been obvious to a person of ordinary skill in the art to modify the invention of Kimura to incorporate the features of Lescouet. One of ordinary skill in the art would have been motivated to make the combination because writing a new Board Support Package allow execution of the Operating System on a new computer with the same CPU but different system devices [paragraph 0061 of Lessouet].

32.   As to claim 11, Kimura as modified teaches wherein the change between operating systems takes place by means of a program code filed in the tunnel area of the memory [paragraphs 0034, 0065, 0088 of Lessouet]. One of ordinary skill in the art would have been motivated to make the combination because this allows the primary operating system drivers to access shared resources, even if the access is requested by the secondary operating system [paragraph 0016 of Lessouet].

33.   As to claim 14, Kimura as modified teaches wherein for each interrupt associated with the secondary operating system (i.e. which is to initiate an interrupt call in the secondary operating system) the system driver generates an entry in the interrupt call table in the primary operating system, which in turn initiates a call of the corresponding interrupt servicing routine in the secondary operating system [handling interrupts (using the real time operating system interrupt service routines, and supplying data where necessary to the virtual interrupt service routines of the secondary operating systems); paragraphs 0083, 0069, and 0141 of Lessouet]. As to the reasons for combining Kimura and Lessouet, see the rejections for claims 5 and 11.

34.   As to claim 16, Kimura as modified teaches wherein in the case of activity of the

secondary operating system (SOS) following an interrupt request through the

information stored in the interrupt call table of the secondary operating system as to the

point in the latter where the running of the interrupt is to take place [paragraphs 0083,

0069, and 0141 of Lessouet], the interrupt call servicing routine of the secondary

operating system (SOS) is directly polled solely by the secondary operating system and

not via the system driver [paragraph 0138 of Lessouet]. As to the reasons for

combining Kimura and Lessouet, see the rejections for claims 5 and 11.

35.   As to claim 20, Kimura teaches wherein clock generation for the secondary

operating system takes place through the hardware timer [clock interrupt generator 111;

col. 4, lines 1 – 3 of Kimura and paragraph 0068 of Lessouet]. As to the reasons for

combining Kimura and Lessouet, see the rejections for claims 5 and 11.

36.   As to claim 23, Kimura as modified teaches wherein the SOS driver has a tunnel

context setting routine for setting a tunnel context in the central processing unit (CPU)

[paragraphs 0034, 0065, 0088 of Lessouet]. As to the reasons for combining Kimura

and Lessouet, see the rejections for claims 5 and 11.

37.   As to claim 25, Kimura as modified teaches wherein the SOS driver has an

interrupt call table change routine for producing entries in the interrupt call table of the

primary operating system, which at least take up entries for the interrupt calls for the

secondary operating system [paragraphs 0083, 0069, and 0141 of Lessouet]. As to the

reasons for combining Kimura and Lessouet, see the rejections for claims 5 and 11.

38.   As to claim 26, Kimura as modified teaches wherein the board support package

(BSP) has a section for return to the primary operating system (POS) [paragraphs 0061

and 0064 of Lessouet]. As to the reasons for combining Kimura and Lessouet, see the

rejections for claims 5 and 11.

39.   As to claim 27, Kimura as modified teaches wherein the secondary operating

system driver (SOS driver) has an interrupt table [paragraphs 0083, 0069, and 0141 of

Lessouet] section by means of which it produces in the primary operating system an

interrupt call table containing a call of an interrupt servicing routine for polling the

secondary operating system [paragraph 0138 of Lessouet]. As to the reasons for

combining Kimura and Lessouet, see the rejections for claims 5 and 11.

40.   As to claim 28, Kimura as modified teaches wherein the system driver is

constructed for producing an entry in the interrupt call table in the primary operating

system (POS) for each interrupt associated with the secondary operating system (SOS),

which i.e. is intended to initiate an interrupt call in the secondary operating system and

that the interrupt call table is constructed for polling the corresponding interrupt

servicing routine in the secondary operating system (SOS) [paragraphs 0083, 0069, and

0141 of Lessouet]. As to the reasons for combining Kimura and Lessouet, see the

rejections for claims 5 and 11.

41.   As to claim 29, Kimura as modified teaches wherein an interrupt call servicing

routine in the system driver is constructed for determining the information stored in the

SOS interrupt table as to the point in the secondary operating system where interrupt

running is to take place [paragraphs 0083, 0069, and 0141 of Lessouet]. As to the

reasons for combining Kimura and Lessouet, see the rejections for claims 5 and 11.

42.   As to claim 30, Kimura as modified teaches wherein it is constructed in the case

of activity of the secondary operating system (SOS) following an interrupt request

through the information stored in the secondary operating system interrupt call table as

to the point in which the secondary operating system interrupt running is to take place,

so as to poll the interrupt call servicing routine of the secondary operating system

directly solely through the secondary operating system and without passing via the

system driver [paragraphs 0083, 0069, and 0141 of Lessouet]. As to the reasons for

combining Kimura and Lessouet, see the rejections for claims 5 and 11.

CONTACT INFORMATION

43.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to LI B. ZHEN whose telephone number is (571)272-3768.

The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hyung Sub Sough can be reached on 571-272-6799. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li B. Zhen/
Primary Examiner, Art Unit 2194